
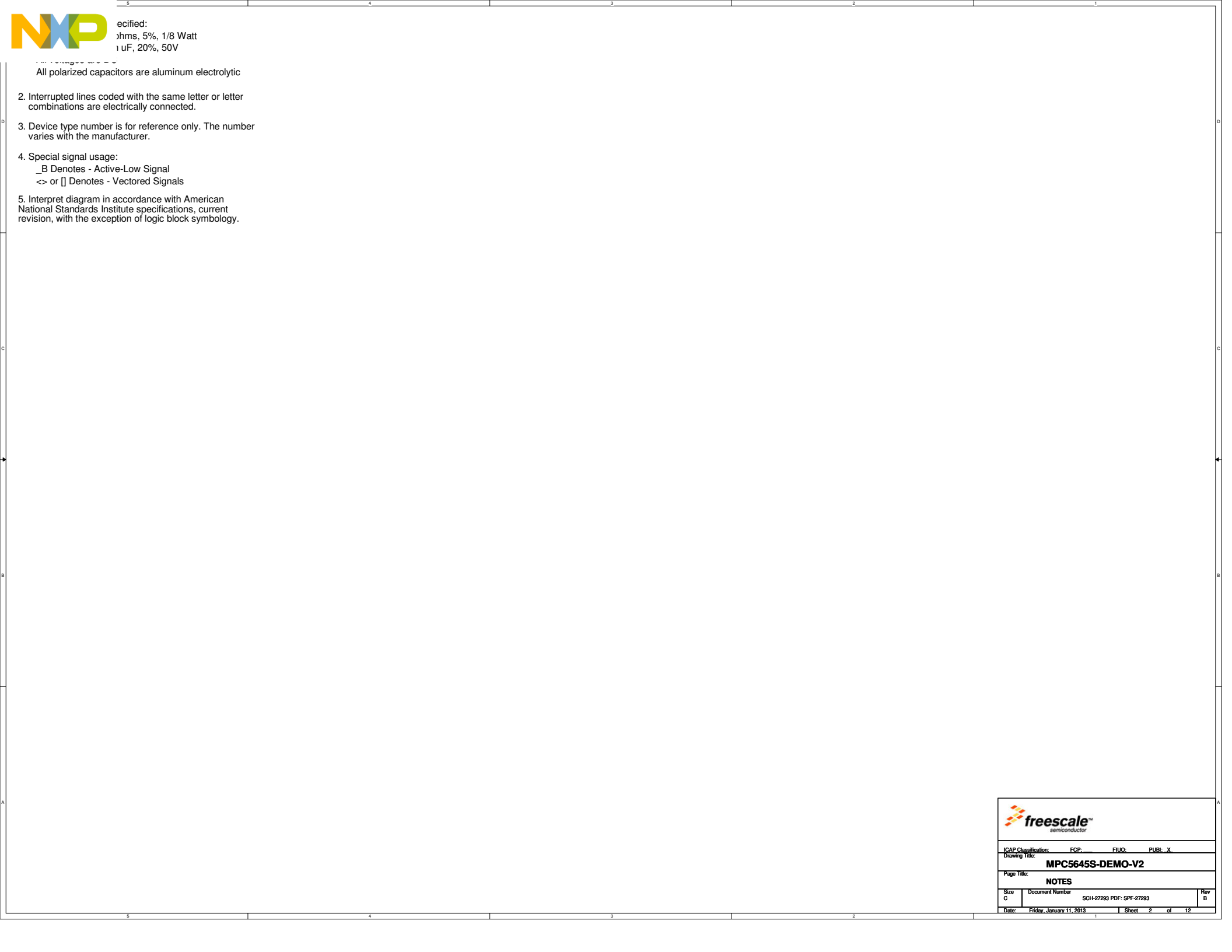


Contents	
History & TOC	
5	Decoupling
6	MPC5645S Peripherals
7	Displays
8	Memory
9	Audio and motors
10	Serial Interface
11	Video Input
12	Debug

Revisions			
Rev	Description	Date	Approved
X1	First production MPC5645S board	05August11	S.McAslan
X2	1. Capacitors C2, C31, C23, C26 changed to higher voltage rating 2.Capacitor C201 moved from VDD_30V to P12V 3.Capacitors C215,C216 added to VDD_30V 4.Capacitors C217,C218, C219,C220 added to DM_VTT_DDR2 power 5.Capacitor C37 added to P12V	18August11	S.McAslan
X3	1.Capacitor C38 & C39 filtering added to USB nets and made as DNP. 2.Net names added before and after FB in power and regulator sections. 3.Differential clock nets suitably appended with _P/_N 4. U14 updated to 344-01142	23August11	S.McAslan
X4	1. Header J31 rotated per Alberto request. 2. IC U4, LIN Transceiver changed from 312-76816 to TMP-WF-15527 (TJA1020T from NXP) 3. Decaps added to U19,U20 and U22	26August11	S.McAslan
X5	1. Pullup resistor added to PF8 (SDA_0), PF9(SCL_0) PF4 (SDA_1) and PF7(SCL_0) and made as DNP 2. Netname between U25 and P11 changed from DCU_* to DCUL_*	30August11	S.McAslan
X6	1. DDR series termination resistor's package changed from 0603 to 0402	05Sep11	S.McAslan
X7	1. DDR series termination resistors RN5 and RN6 package changed to individual 0402 package to aid routing. 2. Capacitor C38 & C39 filtering added to USB nets JM_USB_N/P and made as DNP.	06Sep11	S.McAslan
X8	1. CAN-DB9 pinouts changed to standard connection.	07Sep11	S.McAslan
A	A085 Release	19Sep11	S.McAslan
AX1	A070 Release - J41,J42 connector pin outs reversed R89 removed from U12- pin no 3 R23 value changed from 100ohms to 470ohms U12 - pin 4 is supply changed from 5V_SR to 3.3V_SR - J12 pin 4 is connected with U12- pin 3 (Net name JM_RST_B)	17Nov11 18Nov11	S.McAslan
B	R89(DNP) added at U12- pin no 3, connected to 3.3V_SR MKT part number updated as MPC5645S-DEMO-V2 Board ID, Board Revision are Hard wired. A085 Release	21Nov11 23Nov11 29Nov11 1Dec11	S.McAslan

		Microcontroller Solutions Group 6501 William Cannon Drive West Austin, TX 78752-8689	
<small>This document contains information proprietary to Freescale Semiconductor and shall not be used for engineering design, procurement or manufacture in whole or in part without the express written permission of Freescale Semiconductor.</small>			
Designer: S.McAslan	Drawing Title: MPC5645S-DEMO-V2	ICAP Classification: FQP:	FLUQ: PUB: X
Drawn by: S.McAslan	TITLE PAGE		
Approved: S.McAslan	Size C	Document Number SCH-27293 PDF: SPF-27293	Rev B
Date: Friday, January 11, 2013		Sheet 1 of 12	



specified:
 ohms, 5%, 1/8 Watt
 1 uF, 20%, 50V

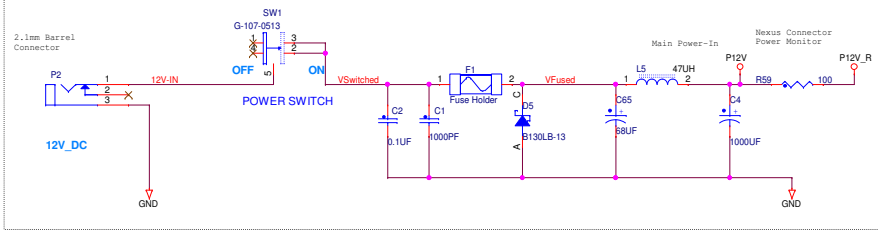
All polarized capacitors are aluminum electrolytic

2. Interrupted lines coded with the same letter or letter combinations are electrically connected.
3. Device type number is for reference only. The number varies with the manufacturer.
4. Special signal usage:
 _B Denotes - Active-Low Signal
 <> or [] Denotes - Vectored Signals
5. Interpret diagram in accordance with American National Standards Institute specifications, current revision, with the exception of logic block symbology.

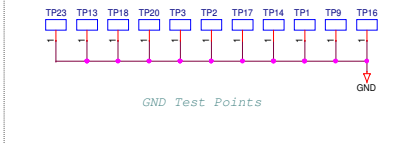
ICAP Classification:		FCP:	FIUC: PUBI: X
Drawing Title:			
MPC5645S-DEMO-V2			
Page Title:			
NOTES			
Size	Document Number	SCH-27293 PDF: SPF-27293	Rev B
Date:		Friday, January 11, 2013	Sheet 2 of 12



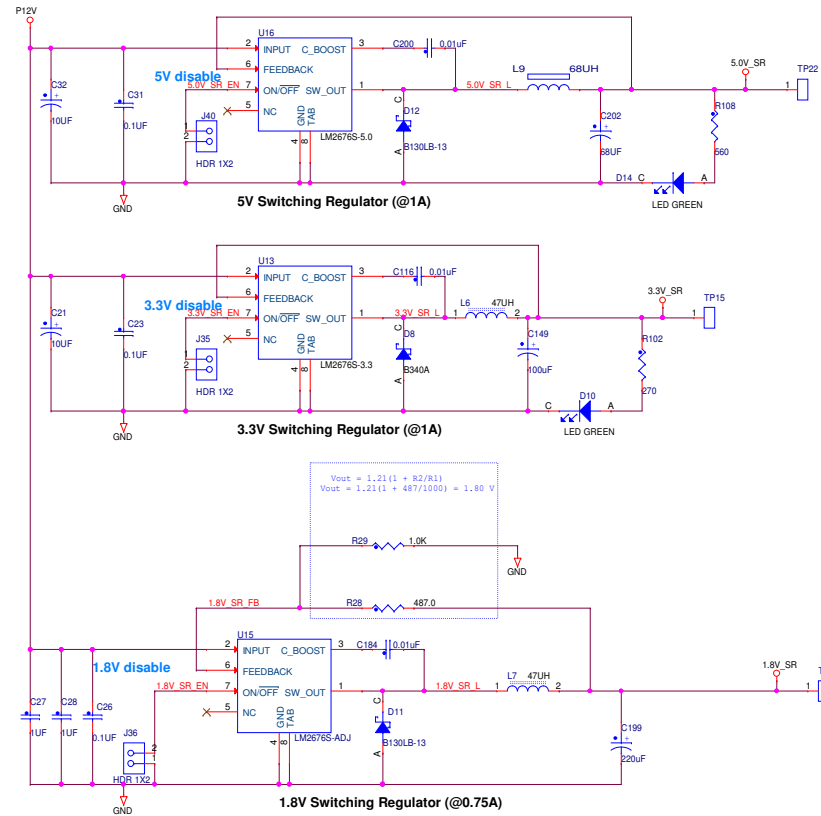
Power supply input and filter



Test and reference points

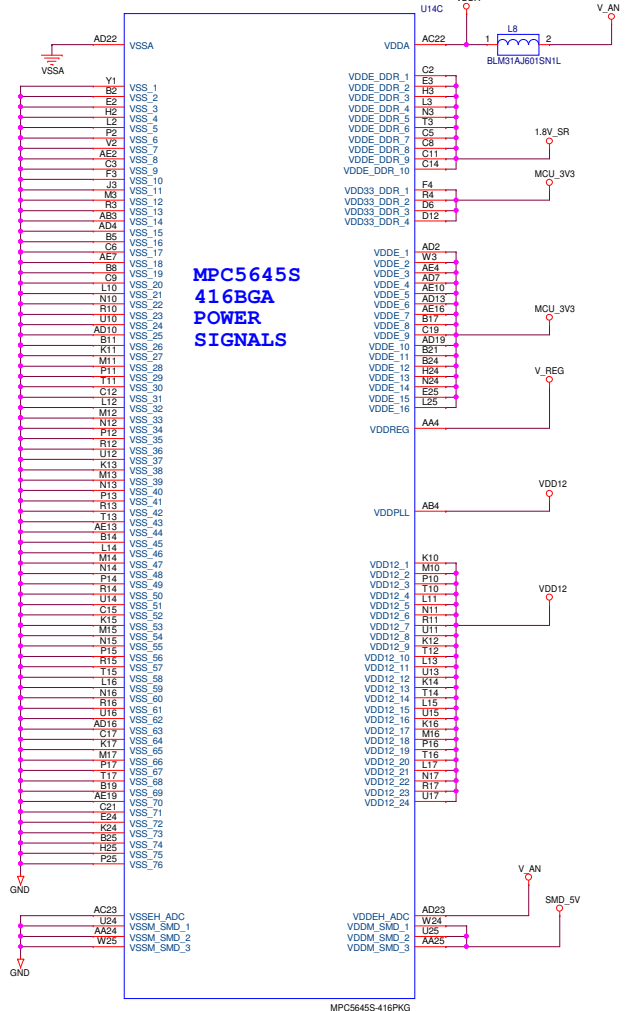
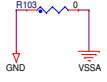


Switching Regulators

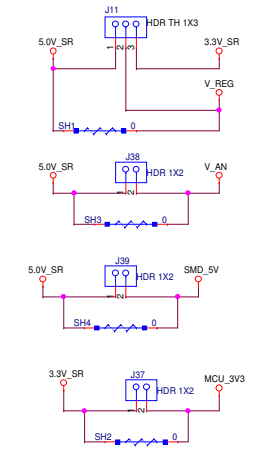




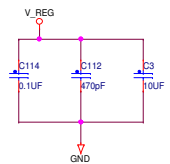
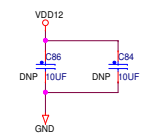
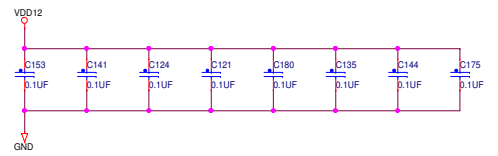
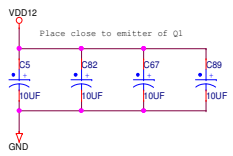
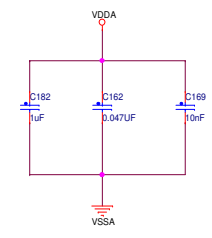
MCU POWER



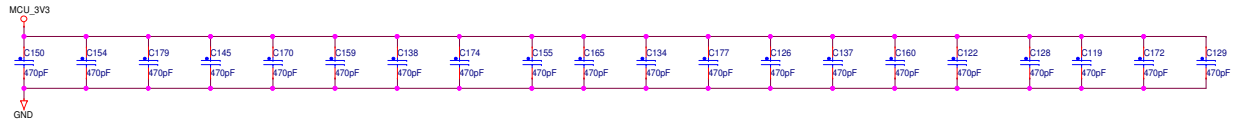
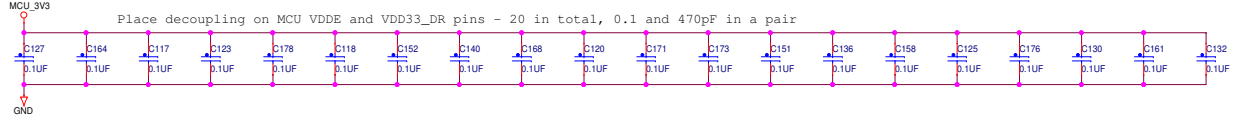
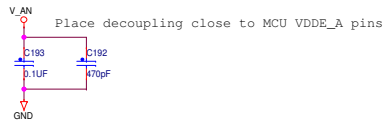
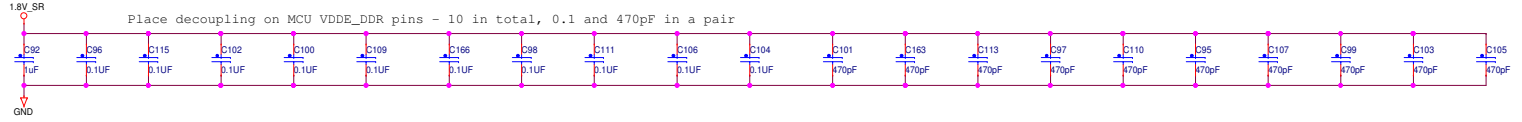
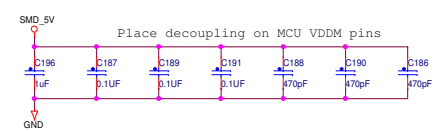
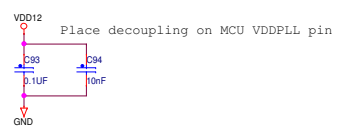
Do not fit jumpers



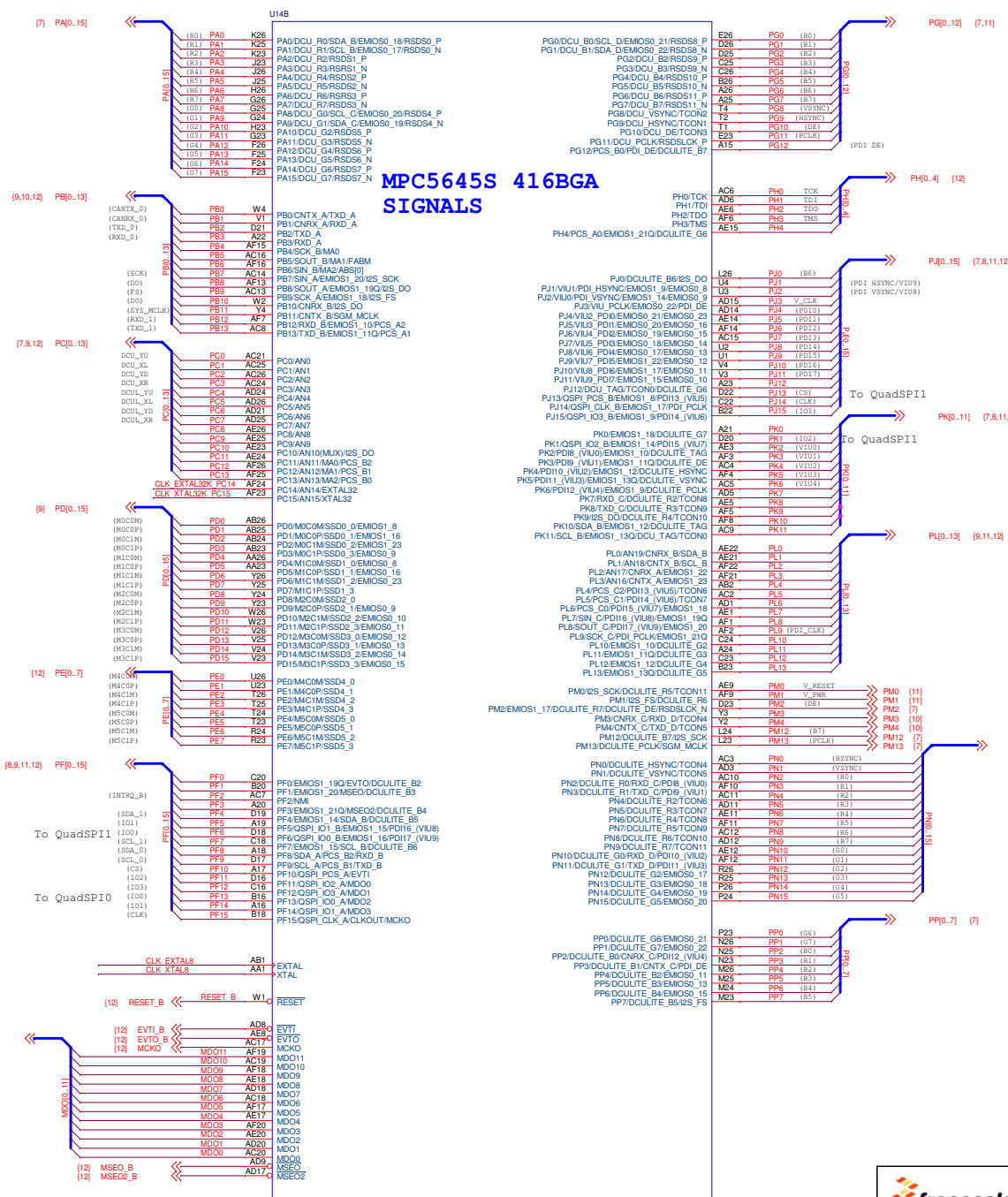
ICAP Classification: FCP		FIUC: PUBI: X	
Drawing Title: MPC5645S-DEMO-V2			
Page Title: MPC5645 Power			
Size C	Document Number SCH-27293 PDF: SPF-27293	Rev B	
Date: Friday, January 11, 2013	Sheet 4	of 12	



Place decoupling on MCU VDDR pin

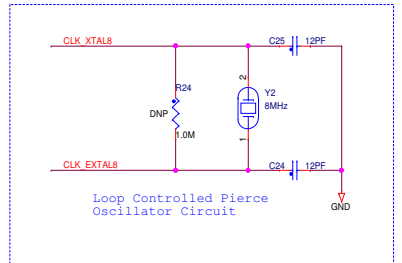
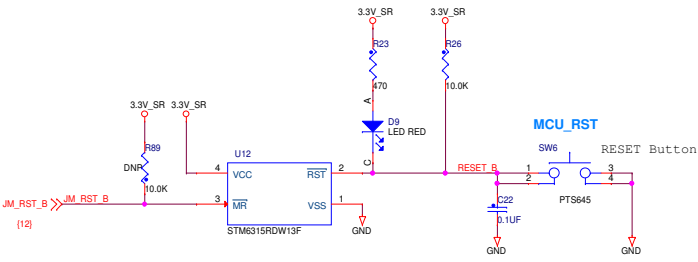
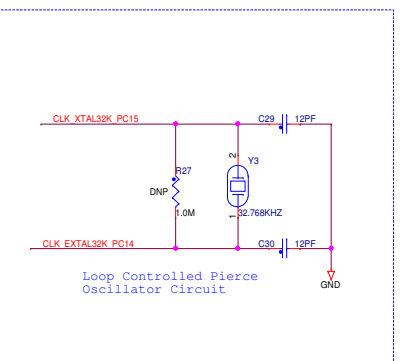


ICAP Classification:		FCP:	FIUC: PUBL: X
MPC5645S-DEMO-V2			
Decoupling			
Size C	Document Number	SCH-27293 PDF: SPF-27293	
Date:		Friday, January 11, 2013	Sheet 5 of 12
			Rev B



MPC5645S 416BGA SIGNALS

Need clock and Reset ccts



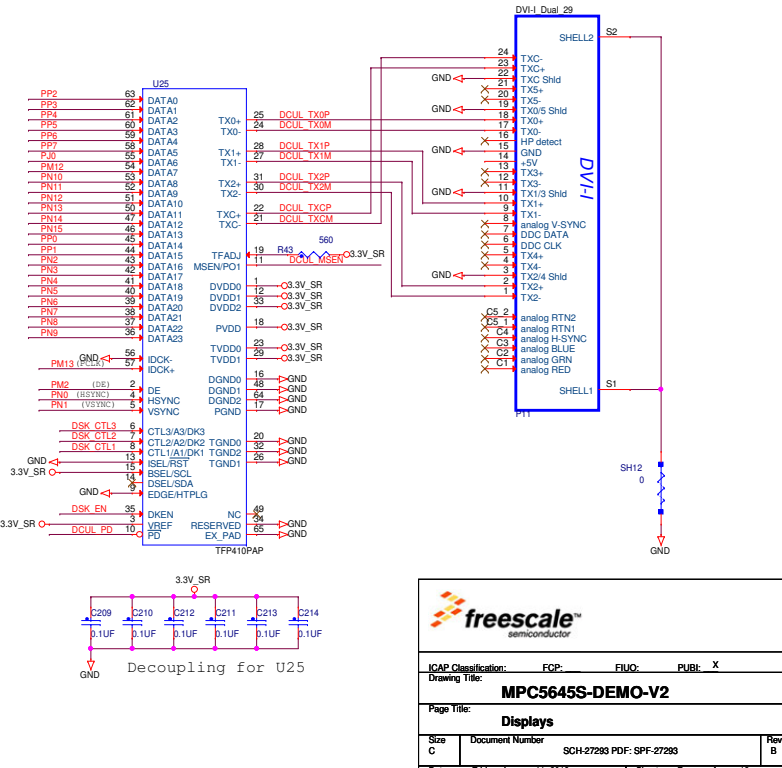
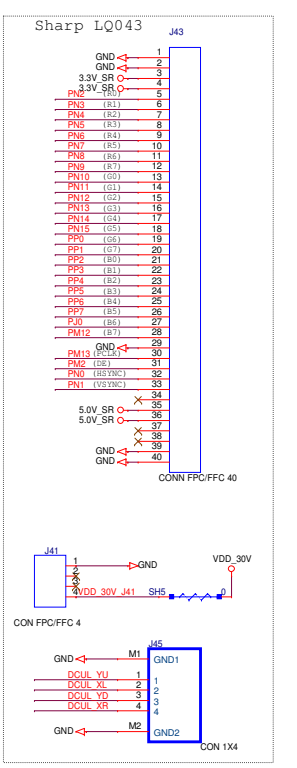
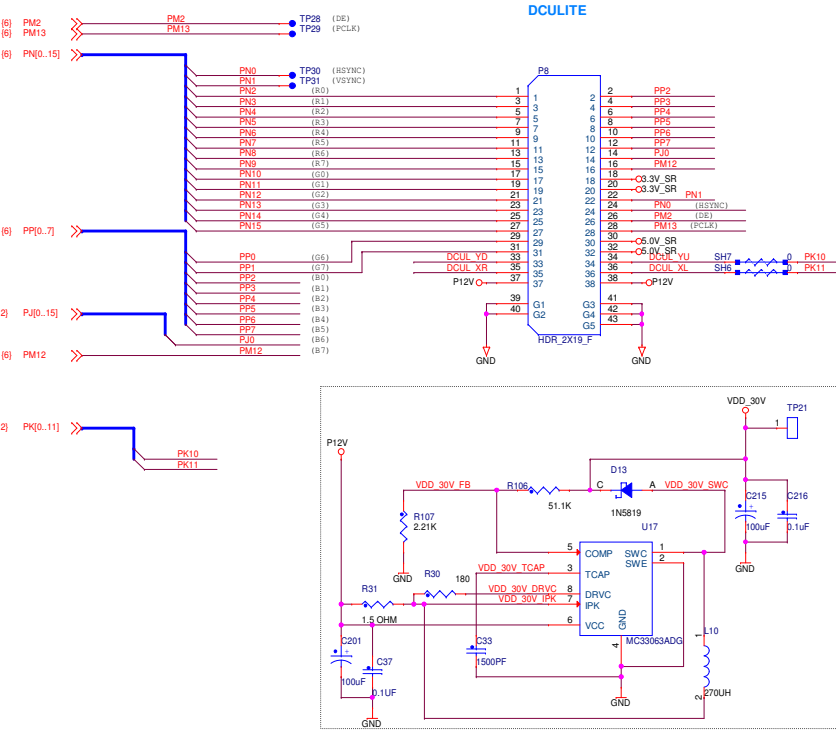
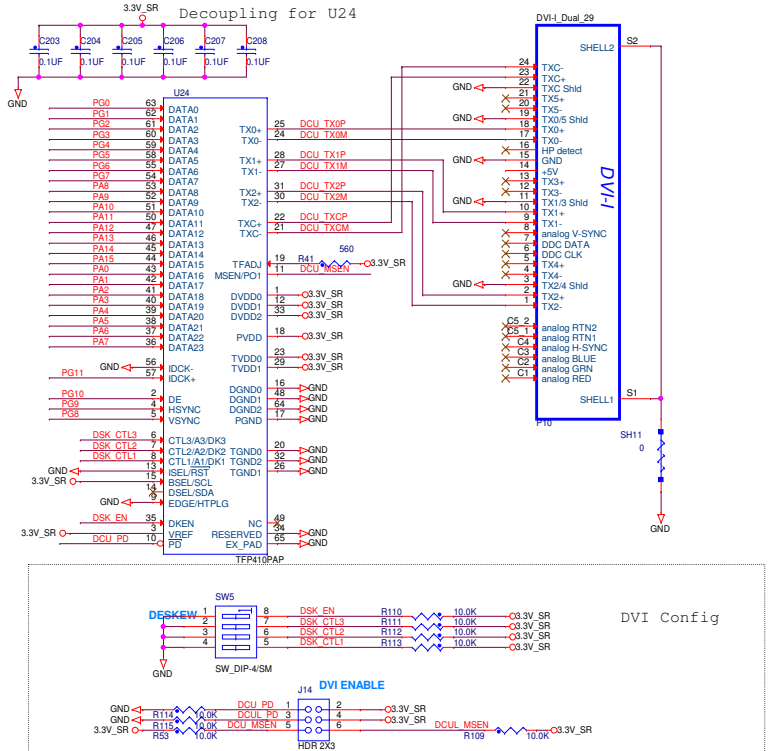
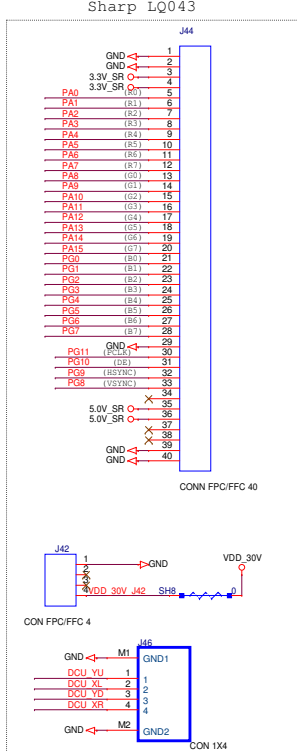
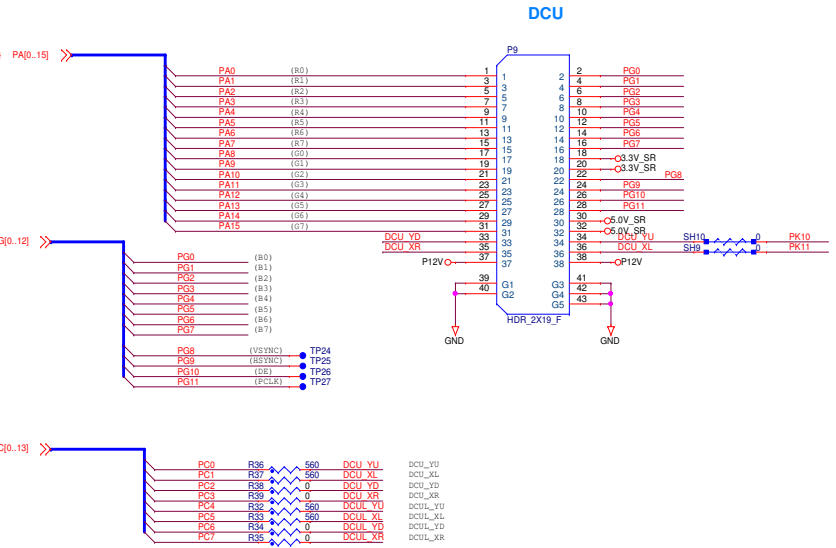
MPC5645S-416BKG

freescale
semiconductor

ICAP Classification: FCP: FIUC: PUB: X
Drawing Title: **MPC5645S-DEMO-V2**

Page Title: **MCU Peripherals**

Size C	Document Number	Rev B
	SCH-27293 PDF: SPF-27293	
Date: Friday, January 11, 2013 Sheet 6 of 12		



ICAP Classification: FQP, EUQ, FUB, X
Drawing Title: **MPC5645S-DEMO-V2**
Page Title: **Displays**
Size C Document Number SCH-27293 PDF: SPF-27293 Rev B
Date: Friday, January 11, 2013 Sheet 7 of 12



D0_31

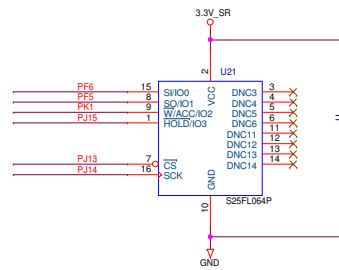
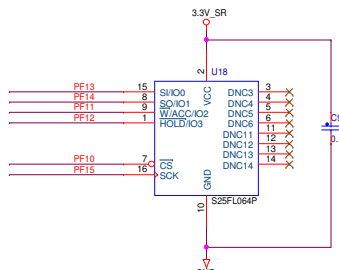
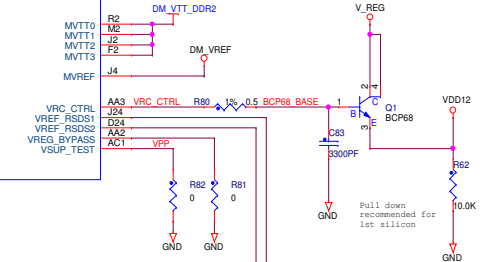
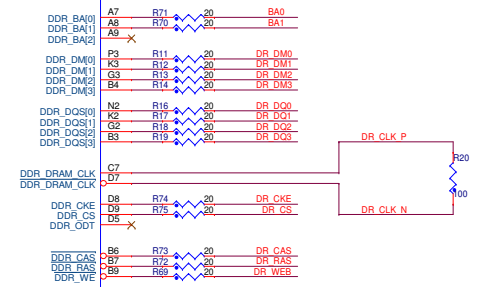
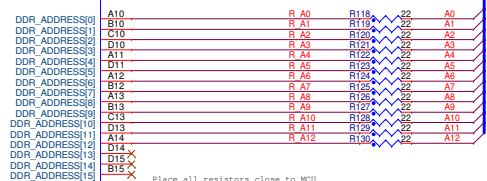
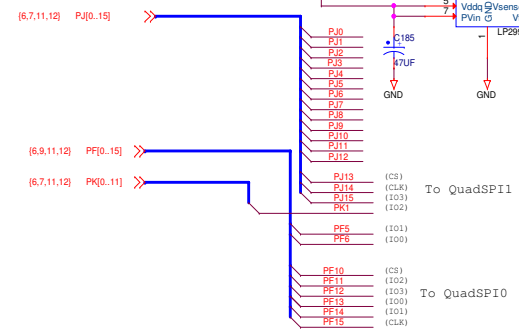
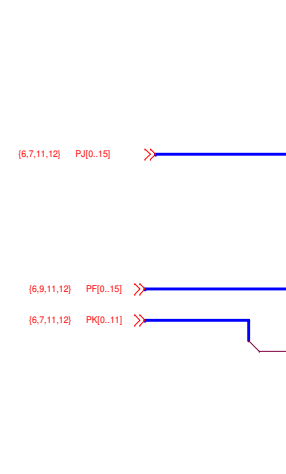
U14A

MPC5645S 41R6GA DDR SIGNALS

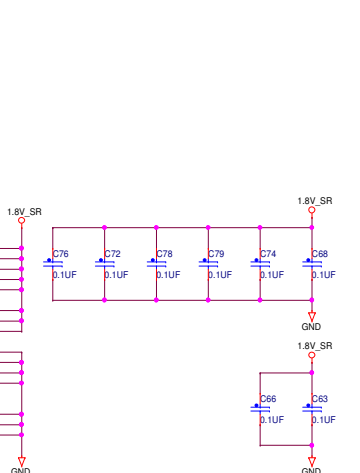
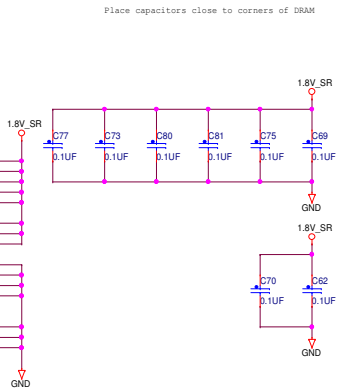
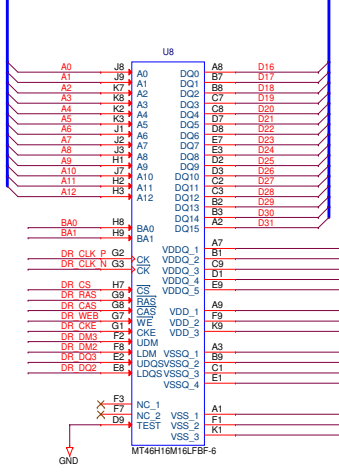
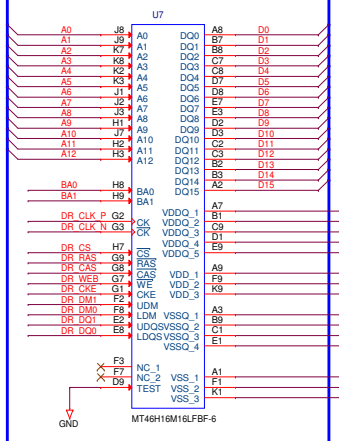
Place all resistors close to MCU

D0	RN1A	1	22	16	R	D0	R1	DDR_DQ0[0]
D1	RN1B	2	22	15	R	D1	P1	DDR_DQ1[0]
D2	RN1C	3	22	14	R	D2	P4	DDR_DQ2[0]
D3	RN1D	4	22	13	R	D3	N1	DDR_DQ3[0]
D4	RN1E	5	22	12	R	D4	N4	DDR_DQ4[0]
D5	RN1F	6	22	11	R	D5	M1	DDR_DQ5[0]
D6	RN1G	7	22	10	R	D6	M4	DDR_DQ6[0]
D7	RN1H	8	22	9	R	D7	L4	DDR_DQ7[0]
D8	RN2A	1	22	16	R	D8	L1	DDR_DQ8[0]
D9	RN2B	2	22	15	R	D9	K1	DDR_DQ9[0]
D10	RN2C	3	22	14	R	D10	K4	DDR_DQ10[0]
D11	RN2D	4	22	13	R	D11	J1	DDR_DQ11[0]
D12	RN2E	5	22	12	R	D12	H1	DDR_DQ12[0]
D13	RN2F	6	22	11	R	D13	H4	DDR_DQ13[0]
D14	RN2G	7	22	10	R	D14	G4	DDR_DQ14[0]
D15	RN2H	8	22	9	R	D15	G1	DDR_DQ15[0]
D16	RN3A	1	22	16	R	D16	F1	DDR_DQ16[0]
D17	RN3B	2	22	15	R	D17	E1	DDR_DQ17[0]
D18	RN3C	3	22	14	R	D18	E4	DDR_DQ18[0]
D19	RN3D	4	22	13	R	D19	D1	DDR_DQ19[0]
D20	RN3E	5	22	12	R	D20	D2	DDR_DQ20[0]
D21	RN3F	6	22	11	R	D21	D3	DDR_DQ21[0]
D22	RN3G	7	22	10	R	D22	D4	DDR_DQ22[0]
D23	RN3H	8	22	9	R	D23	C1	DDR_DQ23[0]
D24	RN4A	1	22	16	R	D24	C4	DDR_DQ24[0]
D25	RN4B	2	22	15	R	D25	B1	DDR_DQ25[0]
D26	RN4C	3	22	14	R	D26	A1	DDR_DQ26[0]
D27	RN4D	4	22	13	R	D27	A2	DDR_DQ27[0]
D28	RN4E	5	22	12	R	D28	A3	DDR_DQ28[0]
D29	RN4F	6	22	11	R	D29	A4	DDR_DQ29[0]
D30	RN4G	7	22	10	R	D30	A5	DDR_DQ30[0]
D31	RN4H	8	22	9	R	D31	A6	DDR_DQ31[0]

MPC5645S-41R6KG



Ensure length of each address and control line is the same after the trace split



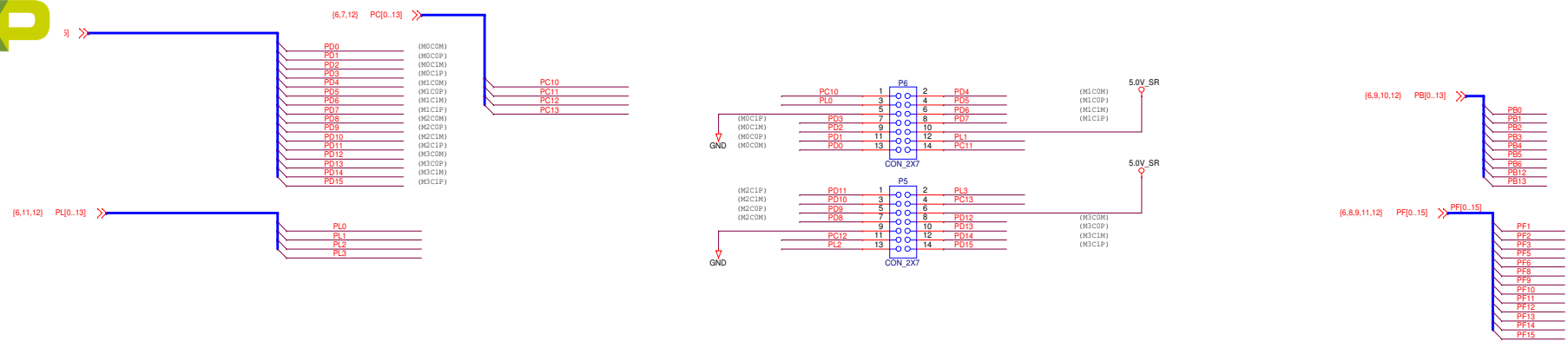
freescale
semiconductor

ICAP Classification: FCP: FIUC: PUB: X
Drawing Title: **MPC5645S-DEMO-V2**

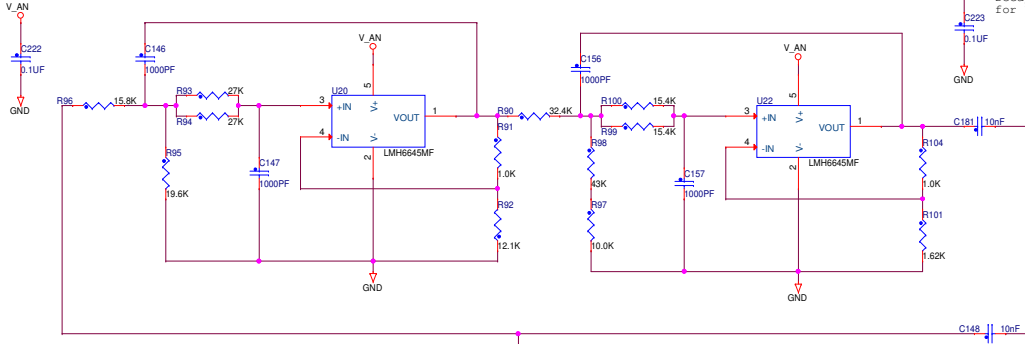
Page Title: **Memory**

Size C	Document Number SCH-27293 PDF: SPF-27293	Rev B
--------	--	-------

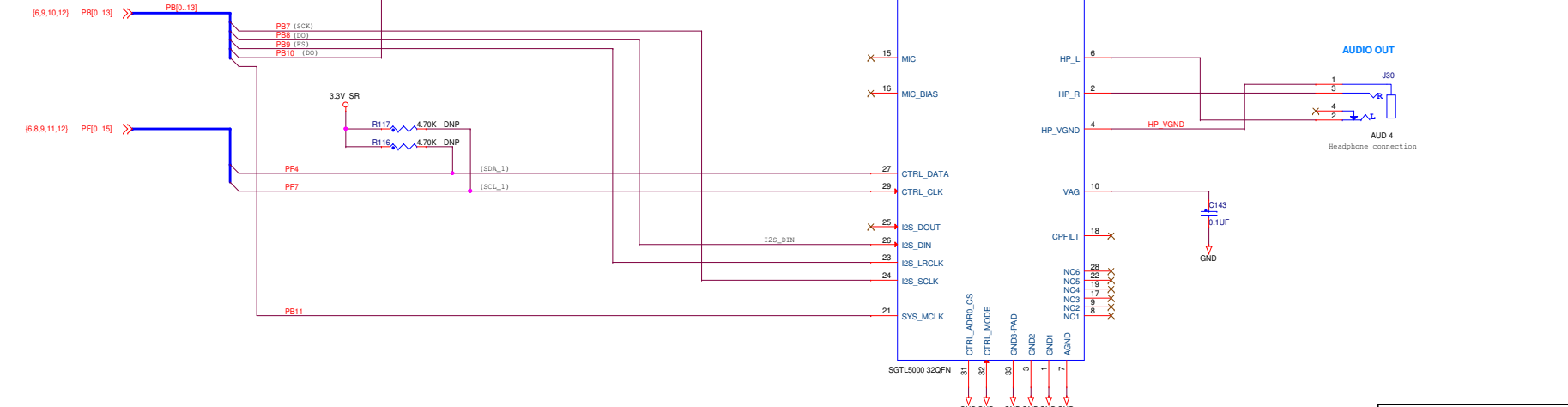
Date: Friday, January 11, 2013 Sheet 8 of 12



Decap for U20

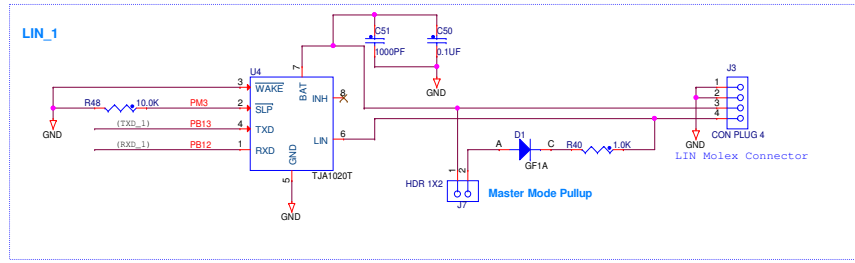
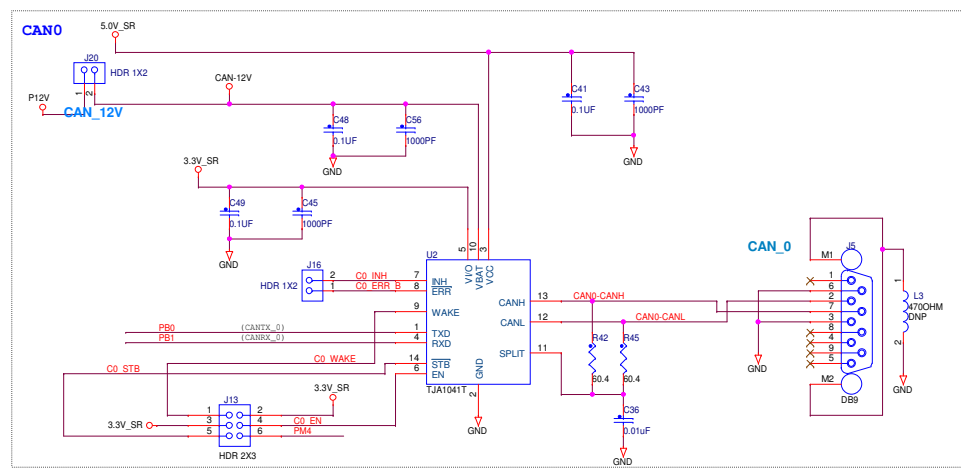
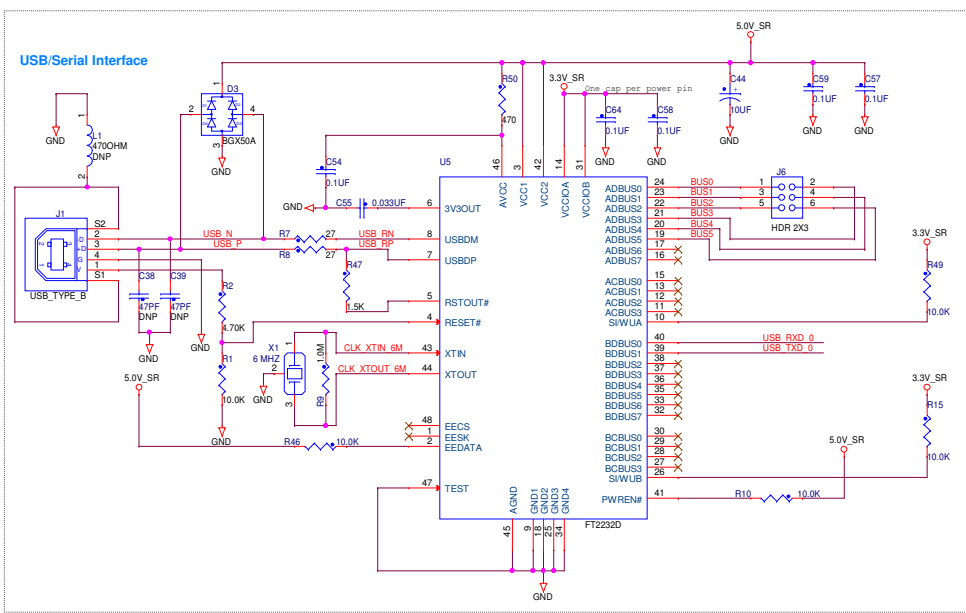
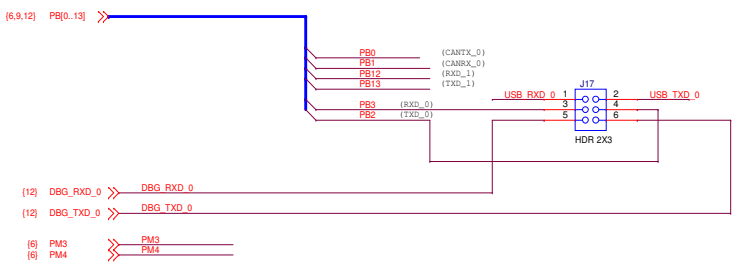


Place jack connectors beside each other



Star wire grounds to single then connect to plane

freescale semiconductor	
ICAP Classification:	FCP: F1UC: PUBI: X
Drawing Title:	MPC5645S-DEMO-V2
Audio and Motors	
Size C	Document Number SCH-27293 PDF: SPF-27293
Date:	Friday, January 11, 2013
Page:	Sheet 9 of 12



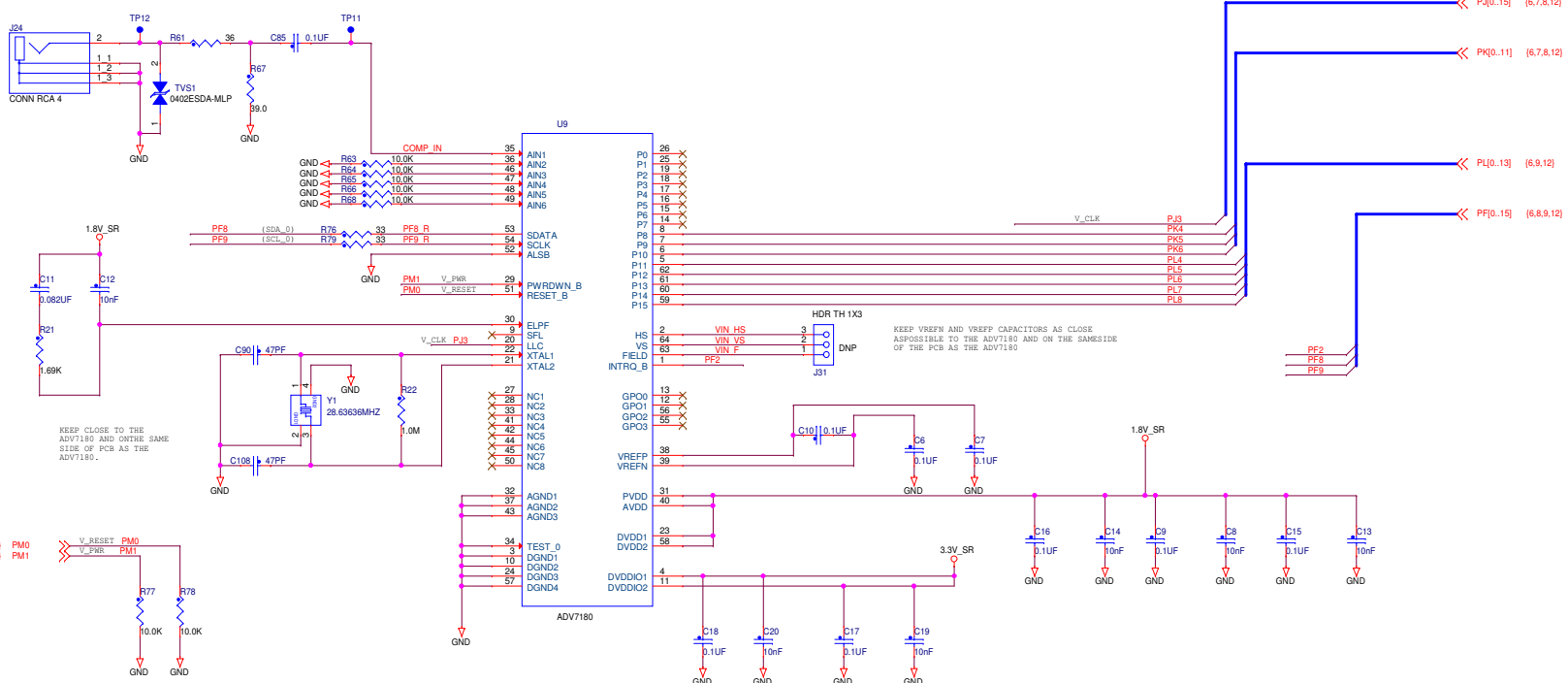
freescale
semiconductor

ICAP Classification: FCP: FIUC: PUB: X
Drawing Title: **MPC5645S-DEMO-V2**

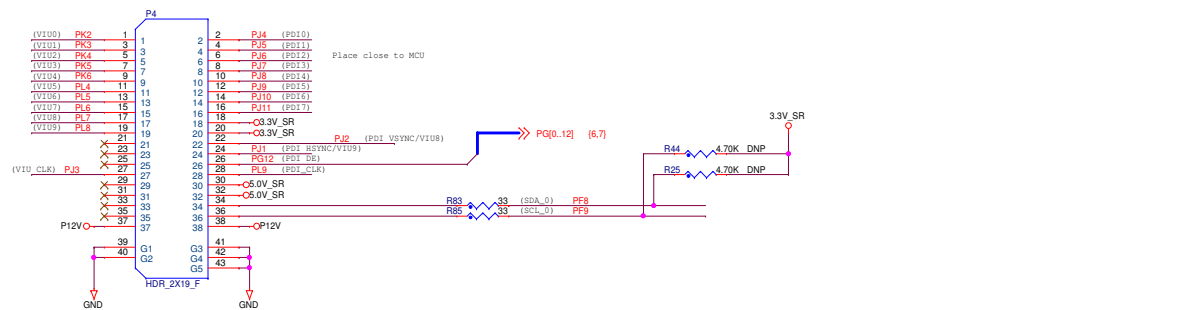
Page Title: **Serial Interface**

Size C	Document Number SCH-27293 PDF: SPF-27293	Rev B
Date: Friday, January 11, 2013	Sheet 10 of 12	

VIDEO IN



Camera input port



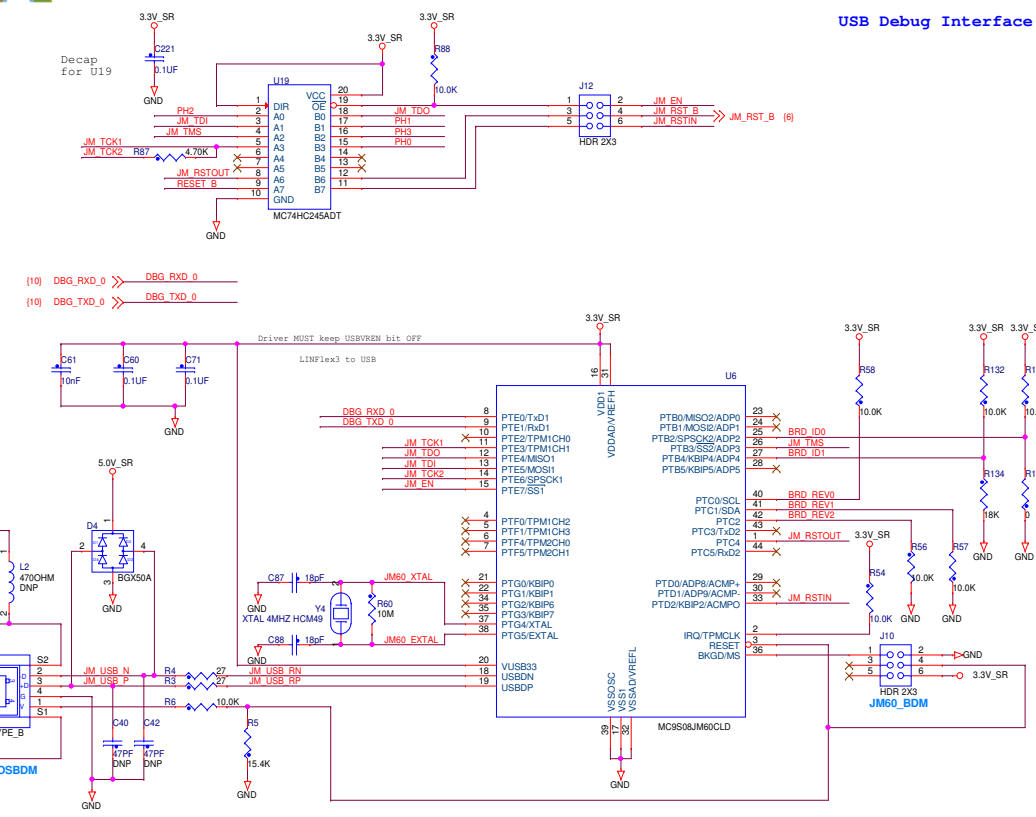
freescale
semiconductor

ICAP Classification: FCP: FIUC: PUBI: X
 Drawing Title: **MPC5645S-DEMO-V2**
 Page Title: **Video Input**

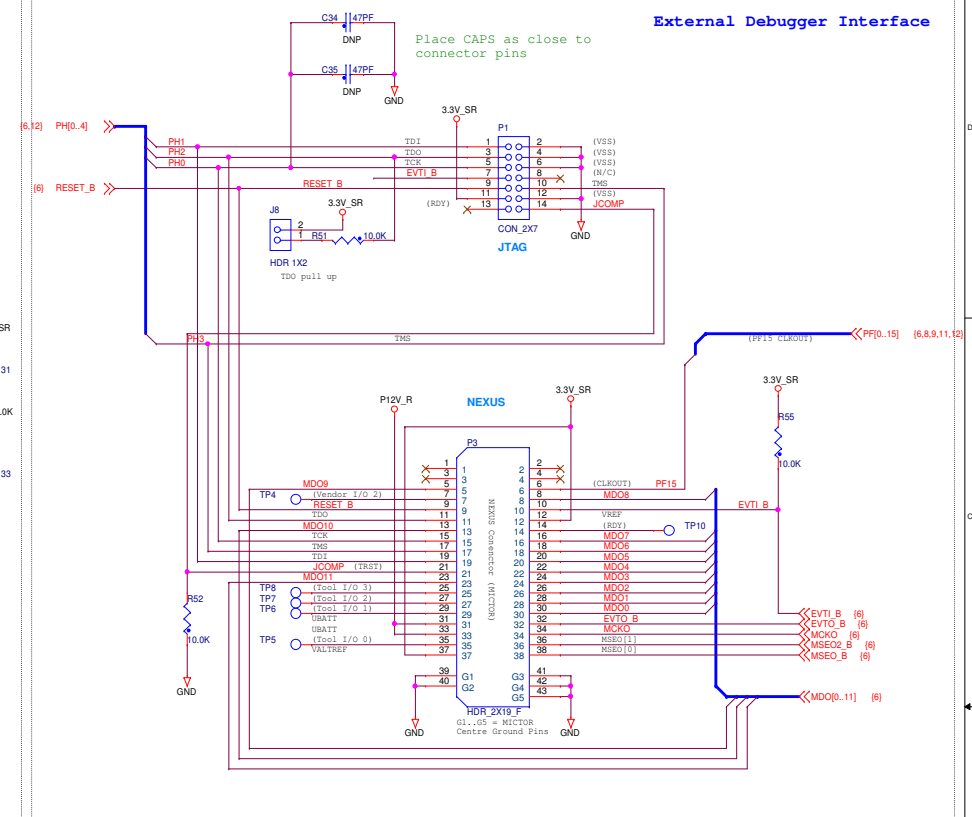
Size C	Document Number SCH-27293 PDF: SPF-27293	Rev B
Date: Friday, January 11, 2013	Sheet 11 of 12	



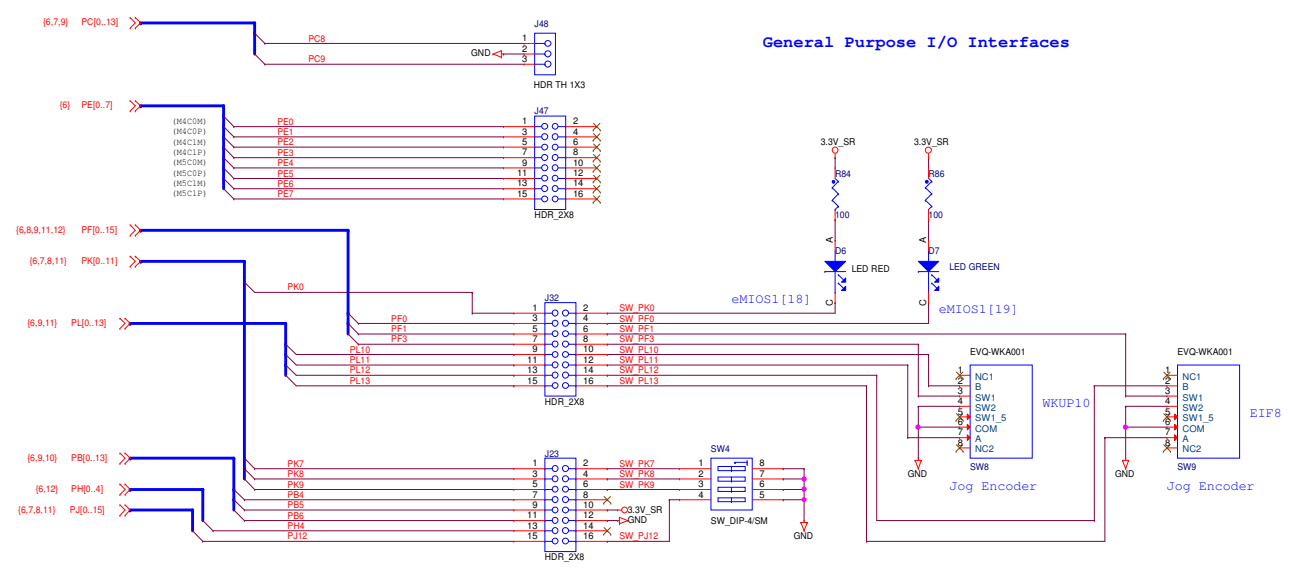
USB Debug Interface



External Debugger Interface



General Purpose I/O Interfaces



ICAP Classification: FCP: FIUC: PUBI: X

Drawing Title: **MPC5645S-DEMO-V2**

Page Title: **Debug**

Size Document Number: SCH-27293 PDF: SPF-27293

Date: Friday, January 11, 2013 Sheet 12 of 12